GENERAL SPECIFICATIONS

VR-3800 MAGNETIC TAPE RECORDER / REPRODUCER

TAPE TRANSPORT

Tape Speeds:	Six speeds, pushbutton selectable: 60, 30, 15, 7.5, 3.75, 1.875 ips.
Reels:	Standard EIA reels to 14 inch diameter are accommodated. CEC precision reels recommended. NOTE: System specifications are established using CEC precision reels, or equivalent.
Tape:	1/2" or 1" width standard, 1 or 1-1/2 mil base mylar or 1-1/2 mil base acetate. All specifications based on using CEC recommended tape.
Start Time:*	Three seconds maximum at 60 ips to capstan controlled speed.
Stop Time:*	Four seconds maximum from 60 ips, utilizing dynamic braking.
Wind/Rewind Time:*	Six minutes maximum for 7200 feet of tape.
Tape Speed Accuracy:	±0.20% at all tape speeds when driven from 60 cps ±0.01% power source.
Flutter (Cumulative Peak-to-Peak):	Less than 0.25% at 60 ips, from 0.20 cps to 10 kc.
Controls:	Illuminated pushbuttons for RUN, RECORD, STOP, WIND, REWIND, each tape speed (60-1.875 ips) and POWER (push-ON, push-OFF). Remote control of all tape speeds and operating modes via connection at the transport by use of accessory CEC Remote Control Unit, or equivalent.

***At nominal line (115 v a-c, 60 cps, 1 ϕ)**

MAGNETIC HEADS

The record and reproduce head stacks are precision mounted on subplates for easy replacement with no adjustment necessary. Head spacing is in accordance with IRIG Document 106-60 "Magnetic Recorder/ Reproducer Standards."

Number of Tracks:	7, 4, and 3 in standard analog head stacks. Transport accommodates 2 headstack assemblies (each including two headstacks for record or reproduce, respectively). Seven channel operation requires one assembly including one four-track and one three-track stack for record and a similar assembly for reproduce.
Track Width:	0.050 ±0.002".
Track Spacing:	.070 ±0.002", center-to-center (interleaved stacks).
Gap Azimuth Alignment:	±1 min of arc, individual.
Gap Scatter:	±50 microinches.

DIRECT SYSTEM

Frequency Response:

Tape Speed—ips	Response ±3 db Over Indicated Bandwidth	SNR*
60	300 cps to 300 KC	32 db
30	150 cps to 150 KC	32 db
15	100 cps to 75 KC	32 db
7-1/2	50 cps to 38 KC	29 db
3-3/4	50 cps to 19 KC	29 db
1-7/8	50 cps to 10 KC	29 db

***Over bandwidths specified . . . .**

Input Level:	0.1 to 15 volts rms (25 v rms maximum without damage) to produce normal record level via input potentiometer control.
Normal Record Level:	1% ±0.1% third harmonic distortion of a 1 kc signal recorded and reproduced at 60 ips.
Input Impedance:	20 K ohms minimum, shunted by 75 pf maximum capacitance.
Output Level:	0 to 1.0 volt rms into a 91 ohm terminated cable.
Output Impedance:	Less than 91 ohms, single-ended.
Intermodulation Distortion:	Less than 0.6% for $F_1 \pm F_2$ components, referred to normal record level.
Phase Response:	The system is phase equalized for optimum reproduction of pulse and transient wave forms.
Bias Frequency:	3.0 mc.

STANDARD FM SYSTEM

Input Level:	0.5 to 10 volts rms for ±40% deviation. (100% modulation).
Input Impedance:	20 K ohms (d-c coupled), single-ended, 75 pf shunt capacity maximum.
Linearity:	±0.75% of full scale from a zero based straight line.
Output Level:	1.0 VRMS into 10 K ohms, shunted by less than 300 pf.
Output Impedance:	7.7 K ohms, nominal.

Bulletin 3800V, June 1965

Frequency Response, Carrier Frequency, SNR, and Distortion:

Tape Speed (IPS)	Carrier Frequency (KC)	Information Freq. Response (KC)	Signal/Noise (RMS Signal/RMS Noise)	Total Harmonic Distortion (%)
60	108	0-20 ±0.5 db	46 db	1.5
30	54	0-10 ±0.5 db	47 db	1.5
15	27	0-5 ±0.5 db	45 db	1.5
7-1/2	13.5	0-2.5 ±0.5 db	42 db	1.5
3-3/4	6.75	0-1.25 ±0.5 db	40 db	1.5
1-7/8	3.375	0-0.625 ±0.5 db	40 db	1.5

EXTENDED BAND FM SYSTEM

Input Level .25 to 10 VRMS for ±40% deviation (100% modulation).
Input Impedance: 20 K ohms, (dc coupled) single ended, 75 pf shunt capacity maximum.
Linearity: ±0.5% of full scale, terminal, zero based (a-c).
Output Level: 2.8 volts peak-to-peak into 5 K ohms shunted by 770 pf ±50 pf capacitance for 100% modulation.
Output Impedance: 5 K ohms single-ended (d-c coupled), nominal.

Frequency Response, Carrier Frequency, SNR, and Distortion:

Tape Speed (IPS)	Carrier Frequency (KC)	Information Freq. Response (KC)	Signal/Noise (RMS Signal/RMS Noise)	Total Harmonic Distortion (%)
60	108	0-40 ±1.3	41 db	2.5
30	54	0-20 ±1.0	41 db	2.5
15	27	0-10 ±0.5	41 db	2.5
7-1/2	13.5	0-5 ±0.5	41 db	2.5
3-3/4	6.75	0-2.5 ±0.7	37 db	2.5

CAPSTAN DRIVE ELECTRONICS

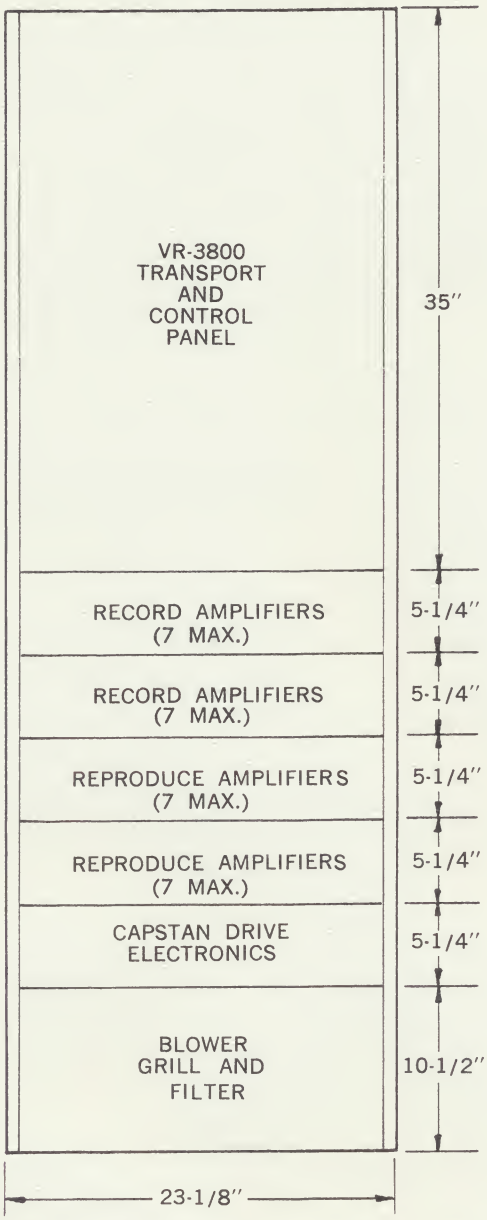
Capstan Power Amplifier and Precision Frequency Generators:

The Capstan Power Amplifier including Precision 60 cps Generator or accessory Precision Multifrequency Generator is the recommended power source for the transport capstan motor. This assembly is a high accuracy, high stability power unit that eliminates the effects of variations in the main power line on the tape drive system and provides a steady tape speed with minimum flutter throughout the range of the system.

Input Power: 105 to 125 v a-c, single phase, 48 to 63 cps.
Output: Precision 60 cps Generator: 60 cps ±0.01% (0 to 50°C), Precision Multifrequency Generator: 60 cps for capstan drive and 3.84 kc, 1.92 kc, 960 cps, 480 cps, 240 cps, 120 cps, 60 cps, 30 cps, 15 cps, 7.5 cps, 3.75 cps, 1.875 cps, and 0.9385 cps, linearly mixed for reference recording.
Input Signals: External Reference: 2.5 v RMS minimum into 510 ohms, 55 to 60 cps. (To Capstan Power Amplifier.)
Servo Input: (From reproduce amplifier output) 1.0 v RMS ±20% into 10 K ohms, unbalanced to ground.
Fail Safe: Capstan Power Amplifier failure reverts capstan power source to an external source (may be connected to power line). When mode selector is in line position, the capstan motor is also connected to this external source.
Servo: An accessory Tape Speed Control Servo may be installed in the Capstan Power Amplifier to compensate for low frequency variations in the tape speed introduced between recording and reproducing. All operating power and signal connections are accommodated within the Capstan Power Amplifier into which the servo is installed. Operation from IRIG 17.0 or 18.24 kc Reference Carrier is accommodated by change of a plug-in filter. A fail safe circuit reverts transport drive power to Precision Power if servo reference signal is lost.

This servo, which provides for recording and playing back at the same speed using a 17.0 kc or 18.25 kc AM reference signal (for tape speeds of 60, 30, 15, and 7-1/2 ips), is also utilized, with change of a plug-in unit, for playing back a tape recorded at any speed, at the same or any other standard speed wherein a composite reference frequency (including multiples and submultiples of 60 cps) has been recorded. Such a composite signal must contain a 60 cps signal during playback for operation of the servo. Servo reference recording/reproducing requires a single FM channel in this system.

VR-3800 OUTLINE DIMENSIONS



TYPICAL 14 CHANNEL RECORD / REPRODUCE SYSTEM

SIZE: HEIGHT: 72″ MAXIMUM, DEPTH: 25-1/2″ MAXIMUM, WIDTH: 24″ MAXIMUM (SINGLE CABINET)

WEIGHT: 950 LBS. FOR 14 CHANNEL RECORD & REPRODUCE WITH CAPSTAN POWER AMPLIFIER

POWER CONSUMPTION: 1900 VOLT AMPS MAXIMUM WITH 60 CPS POWER FOR 14-CHANNEL RECORD / REPRODUCE SYSTEM INCLUDING CAPSTAN POWER AMPLIFIER

POWER SOURCE: 105 TO 125 VAC, SINGLE PHASE, 47-63 CPS
100 VAC, 220 VAC OR 240 VAC INPUT AVAILABLE ON SPECIAL ORDER

NOTE: All specifications based on standard CEC Test Procedures.

DATA RECORDERS DIVISION

CEC

CONSOLIDATED ELECTRODYNAMICS

360 SIERRA MADRE VILLA, PASADENA, CALIF. 91109 • A SUBSIDIARY OF BELL & HOWELL • FINER PRODUCTS THROUGH IMAGINATION

Bulletin 3800V, June 1965